



# Duodenal Pseudomelanosis: A Case-Series of an Incidental Findings on Esophagogastroduodenoscopy in Patients with Epigastric Pain

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## Abstract

Duodenal Pseudomelanosis (DP) also known as pseudo melanosis duodeni is an uncommon entity characterized by upper endoscopic evidence of specks of black- brownish pigmentation of the mucosal layer in the duodenum. Pseudo-melanosis duodeni is commonly seen in females and mostly middle-aged to elderly populations. Pigment (ferrous sulfide) laden macrophages collect in the normal villi of the duodenum. It is linked to certain medical conditions and medications. Common associations include but are not limited to female gender, systemic diseases such as chronic kidney disease, hypertension, use of certain medications like hydralazine for control of high blood pressures and iron supplementation, hydrochlorothiazide, ferrous sulfate, furosemide, and propranolol. While pseudo melanosis is more widely described as a finding on colonoscopy visualization, it is a rare entity in the small intestine. Metastatic malignant melanoma, Peutz Jeghers Syndrome, hemosiderosis and brown bowel syndrome (caused by long-term malabsorption and lipofuscinosis) were ruled out in this case and must be on the differential. Here we are presenting two cases of DP found incidentally and discussing its significance and management.

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## Introduction

In 1976 Duodenal Pseudomelanosis (DP) was first described by Bisordi and Kleinman as melanosis duodeni. It is an asymptomatic and benign finding which is more commonly seen in middle aged to elderly females, this condition is distinguished by the uncommon endoscopic presentation of distinct speckled black pigmentation on the duodenal mucosa. It is essential to note that this pigmentation is not attributed to melanocytes, leading to usage of the term "pseudo melanosis" to describe this phenomenon [1]. DP is a rare, benign, incidental finding of unknown etiology seen on the upper gastrointestinal endoscopy [2]. On endoscopic examination it appears as specks

of brownish- black pigmented dots in the mucosa of the small intestine. It is called pseudo melanosis as the pigment is not produced by the melanocytes. On histological examination, pigment is seen deposited at the tip of the duodenal villi in the macrophages of the lamina propria. It is found in the stomach, duodenum and jejunum; however, it most commonly occurs in the duodenum. When these pigmented, indolent lesions are seen in duodenum, it is known as Duodenal Pseudo melanosis (DP) or pseudo melanosis duodeni. Certain medications such as ferrous sulfate, thiazides, vitamins, furosemide, digoxin and methyldopa have been linked to DP. And some chronic medical



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conditions such as end stage renal disease [3] chronic hypertension, congestive heart failure, anemia have also been reported to be associated with DP [2,4]. The pathogenesis and its course are not yet clearly defined [2].

**Case Presentation**

**Case 1**

We report a case of a 56-year-old female who has a significant history of ESRD (end stage renal disease) who is maintained on hemodialysis, has a long-standing history of hypertension, awaiting kidney transplant presented with epigastric pain and endoscopy was done. The patient is on multiple medications such as hydralazine, minoxidil, clonidine, carvedilol, for her hypertension. Patient denied use of non-steroidal anti-inflammatory drugs, laxative or iron supplements. Reported severe allergy to contrast dye (diatrizoate) which leads to shortness of breath and rash which subsides with methylprednisolone and diphenhydramine. Denied headaches, fever, chills, dizziness, weakness, numbness in any part of the body, cough, chest pain/discomfort, palpitations, diaphoresis, abdominal pain, nausea, vomiting, diarrhea, constipation, dysuria, hematuria, hemoptysis, hematemesis, or melena. Upon further evaluation vital signs were within normal limits. Patient was awake, alert, oriented times 3 and well developed, well nourished, with a pleasant demeanor, lung examination revealed mild shortness of breath, regular rate and rhythm, No murmur, rubs, gallops, clear to auscultation bilaterally, abdomen soft, non-tender, non-distended, no organomegaly, no cyanosis or edema in extremities, however, had a left arterio-venous fistula, neurological examination revealed no focal neurological deficits, motor strength 5/5 throughout and sensations intact. Esophagogastroduodenoscopy was remarkable for multiple diminutive brownish-black speckles of discoloration in the entire duodenum (Figure 1 and 2). Biopsy confirmed multiple foci of brownish - black pigmentation (melanosis) within the macrophages inside the tips of the villi



**Figure 2:** Duodenal Melanosis endoscopic findings Case 1 Image 2.

**Case 2**

Patient is a 59-year-old female with a significant history of hypertension, diabetes mellitus, schizophrenia, anemia and chronic kidney disease, presented with epigastric pain for which endoscopy was performed. She is currently taking amlodipine, labetalol, hydralazine, plavix, perphenazine, clonazepam, gabapentin, iron supplements, insulin, levocarnitine, renal vitamins and vitamin D. She denies nausea, vomiting, diarrhea, constipation, dysuria, hematuria, hemoptysis, hematemesis, or melena. The patient's vitals were stable with normal general physical examination. Esophagogastroduodenoscopy was performed and remarkable for incidentally found multiple brownish-black speckles of discoloration in the entire duodenum (Figure 3 and 4) and biopsy showed no significant pathological changes except brownish pigment deposits.



**Figure 3:** Duodenal Melanosis on endoscopy Case 2 Image 1.



**Figure 1:** Duodenal melanosis Endoscopic findings Case 1 Image 1.



**Figure 4:** Duodenal Melanosis endoscopic findings Case 2 Image 2.

### Discussion

Pseudo melanosis duodeni (PD) is an infrequent condition characterized by a dark speckled appearance in the duodenum. This peculiar condition is more commonly observed in middle-aged to elderly individuals, with a higher prevalence among females [4]. PD is often associated with various health conditions, including chronic renal failure, chronic heart failure, arterial hypertension, diabetes mellitus, and gastrointestinal bleeding [5]. Additionally, certain medications such as ferrous sulfate, hydralazine, propranolol, hydrochlorothiazide, and furosemide may also contribute to its occurrence [5].

Histological examination reveals a fine granular brown substance present within the macrophage lysosomes in the lamina propria at the tips of the duodenal villi [5]. While melanosis coli, a related condition, is caused by lipofuscin accumulation in colon macrophages, the pigment found in duodenal pseudo melanosis mainly consists of iron sulfide, although other elements like calcium, potassium, aluminum, magnesium, silver, lipo melanin, hemosiderin, and ceroid may also be present [6]. To identify these pigments in macrophages, Perl's Prussian blue and Fontana-Masson stains can be utilized [7].

Tang et al. hypothesized mucosal injury caused by pills expose the gut macrophages to iron and other pigments and the duodenum is an absorptive organ for these pigments. Others have theorized that the sulfur component of various antihypertensives such as hydralazine and furosemide could lead to accumulation of iron sulfide, causing the pigmentation [7].

### Conclusions

Duodenal Pseudo melanosis is regarded as a benign condition with no reported associations with fibrosis, duodenitis, or stricture formation, unlike diseases caused by iron or other heavy metal depositions. As a result, there is currently no established specific therapy, medication changes, or endoscopic surveillance required for its management. In the future we need to follow up with these patients after the original endoscopy to monitor progression, resolution or see if these peculiar mucosal lesions remain the same.

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